

We Claim:

1. A novel protein capable of inhibiting anthrax toxin activity said protein comprising of following characteristics:
 - 10 (i) Hydrophobic in nature,
 - (ii) Molecular weight 67 kDa,
 - (iii) Stable at room temperature,
 - (iv) Resistant to trypsin,
 - (v) Having no proteolytic activity,
 - 15 (vi) Inhibits proteolytic cleavage of protective antigen (PA) of *B. anthracis* in a dose dependent manner,
 - (vii) Binds to IgE, and
 - (viii) The protein is devoid of any carbohydrate moiety.
- 20 2. A protein as claimed claim 1 wherein the said protein is isolated from the pollen grains of grass species selected from group of *Imperata cylindrica* (Ic), *Lolium perenne*, *Phleum pratense*, *Cynodon dactylon* and related genus.
3. A protein as claimed in claim 1 wherein the said protein is stable in the temperature
 - 25 range of about 3°C to 40°C
4. A protein as claimed in claim 3 wherein the said the protein is stable in the temperature range of about 4°C to 37°C.
- 30 5. A protein as claimed in claim 1, wherein protein in the range of about 25-20 ng completely inhibits the protective antigen (PA) of the anthrax toxin.
6. A protein as claimed in claim 1, wherein the protein in the range of about 15-5 ng partially blocks the cleavage activity of the PA.
- 35 7. A protein as claimed 1, wherein the protein in the range of about 25 ng to 11,000 ng is efficient in inhibiting the anthrax toxin activity.

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8. A protein as claimed 11, wherein the protein in the range of about 50 ng to 10,000 ng is efficient in inhibiting the anthrax toxin activity.

9. A process of isolating the novel protein capable of inhibiting anthrax toxin activity, said process comprising steps of:

- (i) extracting the total protein from the grass pollen by suspending the pollen in phosphate buffer for a period of about 3h to 15 h under stirring continuously under cold conditions followed by high speed centrifugation at 15,000 rpm,
- (ii) purifying protein fractions from the extract of step (i) by column chromatography,
- (iii) lyophilizing the dialyzed protein fraction containing the protein of interest obtained in step (ii).
- (iv) subjecting the protein fractions of step (iv) to SDS-PAGE followed by Western blotting and immuno-staining to separate and locate the protein of interest,
- (v) testing the ability of the purified protein to inhibit anthrax toxin activity by incubating the isolated protective antigen (PA) of *B. anthracis* with or without lyophilized isolated protein from a grass in presence of trypsin for measuring the PA cleaving (inhibitory) activity of the isolated protein by SDS-PAGE in a dose dependent manner.
- (vi) characterizing the purified protein allergenic activity by SDS-PAGE, Western blotting and immuno-staining.

10. A process as claimed in claims 13, wherein the pollen grains for purification of the protein in the step (i) are collected from grasses selected from group comprising of *Imperata cylindrica* (Ic), *Lolium perenne*, *Phleum pratense*, *Cynodon dactylon* and related genus.

11. A process as claimed in claim 13 wherein the buffer used for extraction of pollen in the step (i) is selected from group comprising of 0.1M PBS or 0.1 M ammonium bicarbonate of pH ranging from 7.0 to 8.0.

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12. A process as claimed in claim 13 wherein the material used for the column chromatography in step (ii) is a hydrophobic resin selected from octadecyl silica gel and similar silica gels.

10 13. A process as claimed in claim 13, wherein the protein bound to the chromatography column in step (iii) is eluted with acetonitrile in range of about 30-75% and about 0.50 z% Trifluoroacetic acid (TFA) in water.

14. A process as claimed in claim 17, wherein the acetonitrile is in the range of about 40-
15 60% and TFA is about 0.1% in water.

15. A process as claimed in claim 13 wherein the protein obtained in step (vi) is stable in the temperature range of about 3°C to 40°C

20 16. A process as claimed protein as claimed in claim 19 wherein the said the protein is stable in the temperature range of about 4°C to 37°C.

17. A process as claimed in claim 13, wherein protein in the range of about 25-20 ng completely inhibits the protective antigen (PA) of the anthrax toxin.

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18. A process as claimed in claim 13, wherein protein in the range of about 15-5 ng partially blocks the cleavage activity of the PA.

19. A process as claimed in claim 13, wherein the protein in the range of about 25 ng to
30 11,000 ng is efficient in inhibiting the anthrax toxin activity.

20. A process as claimed in claim 25, wherein the protein in the range of about 50 ng to 10,000 ng is efficient in inhibiting the anthrax toxin activity.

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